Atlantic Oceanographic and Meteorological Laboratory

Specializing in hurricanes, climate, coastal, and open ocean research

What Does the Atlantic Oceanographic and Meteorological Laboratory Do for the Nation?

Research at the Atlantic Oceanographic and Meteorological Laboratory (AOML) improves the understanding and prediction of hurricane track and intensity, the ocean's role in annual-to-multi-decadal climate variability, and human impacts on coastal ecosystems. Our research encompasses oceans and climate, the global impacts of increased carbon dioxide and ocean acidification, ocean and human health studies, and the ocean's influence on regional rainfall and hurricanes. AOML is also a major partner in the collection and interpretation of oceanographic data collected via ships, satellites, aircraft, drifting buoys, and floats.

Recent Accomplishments

Developed a method to estimate air-sea CO_2 fluxes on seasonal time scales utilizing ship of opportunity and satellite remote sensing data.

Benefits: Increased understanding of the global carbon **cycle. This information can be used to help verify whether CO_2 emission reduction efforts are working.**

Initiated the first time-series program to observe key components of the Atlantic Meridional Overturning Circulation in the South Atlantic.

Benefits: Improves long-term climate forecasting as requested in the U.S. Interagency Ocean Research Priorities Plan.

Developed a set of diagnostic packages to compare hurricane models and observations.

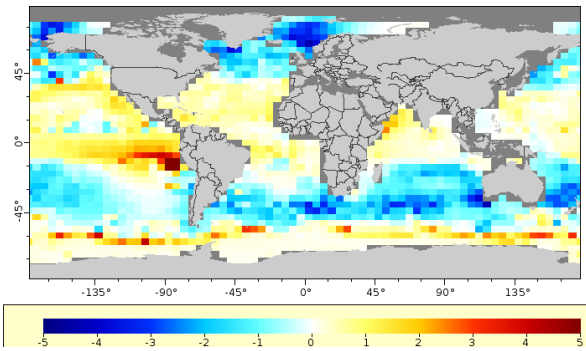
Benefits: Allows for accelerated analysis and evaluation of model performance.

Published innovative research showing the inter-hemispheric influence of the Atlantic warm pool on the southeastern Pacific.

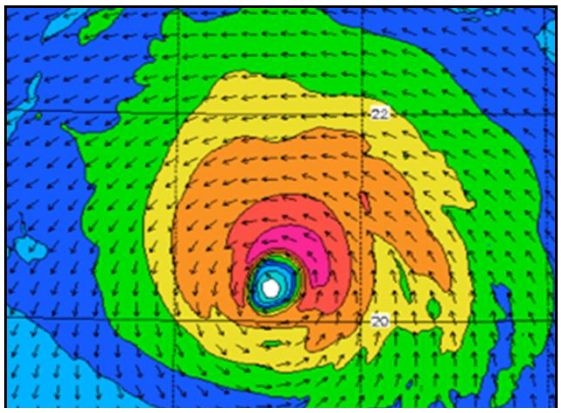
Benefits: Improved the understanding of why almost all state-of-the-art climate models have a severe warm bias in the southeastern Pacific.

Completed a collaborative Fisheries Oceanography survey of the northeastern Caribbean Sea.

Benefits: Improved understanding of the role of ocean currents on economically important larval reef fish and a better ability to designate optimal Marine Protected Areas (MPAs).



Sept. 2009 air-sea CO_2 flux map. (Image based on research by G.H. Park, J. Trinanes, and R. Wanninkhof)



HWRFx run of Hurricane Bill in 2009 (HRD/AOML)

Developed the experimental Hurricane Weather Research & Forecast model (HWRFx) and tested it in real-time for every Atlantic tropical system in 2009 with 9-km outer and 3-km inner resolution.

Benefits: Increased model resolution is enabling improved forecast accuracy.

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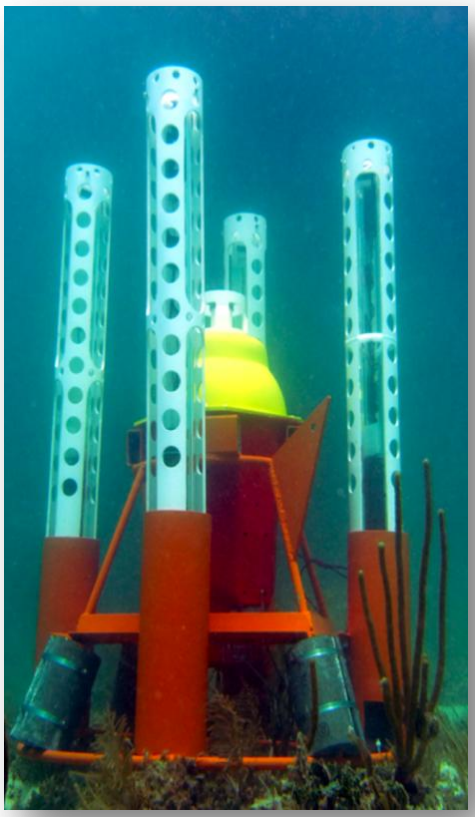
R/V Hildebrand upon arrival at its new home port in Miami, Florida. (Photo: Erica Rule/AOML)



The first field test of the ABIISS datapod system for cost-effective data retrieval from the deep ocean in near real-time. (Photo: Nelson Melo, AOML/CIMAS)

What's Next for AOML?

- Recent acquisition of the Research Vessel Hildebrand (pictured left) will enable significant augmentation to research designed to investigate coastal ocean processes at minimum cost to the laboratory.
- Maintain strong participation in the implementation and sustainability of the ocean observing system for climate studies and a continued emphasis in analysis of these observations.
- Add enhanced ocean acidification chemistry and ocean optics observations to existing observational programs in Florida Keys, Puerto Rico, and the U.S. Virgin Islands.
- Analyze and evaluate data assimilation schemes for the Hurricane Weather Research and Forecast experimental model system (HWRFx) focusing on the use of dropsondes and Doppler radars.
- Plan and execute the 2010 Intensity Forecast Experiment, coordinating with National Science Foundation-sponsored PREDICT and National Aeronautics and Space Administration-sponsored Genesis and Rapid Intensification Processes field projects.

Research Partnerships

AOML partners with all components of NOAA; many universities, especially the University of Miami through the Cooperative Institute of Marine and Atmospheric Studies (CIMAS); numerous other Federal agencies including the Environmental Protection Agency, Army Corps of Engineers, NASA, and the Office of Naval Research; regional agencies such as the South Florida Water Management District; and several foreign research organizations.

Did You Know?

AOML annually welcomes over 20 graduate students, undergraduate Hollings Scholars, and highly motivated high school students to work side by side with our researchers!

Budget and Staff

The fiscal year 2010 enacted budget for AOML is $15.6M. The fiscal year 2011 President's budget request for AOML is $15.9M. The fiscal year 2010 President's budget request for AOML was $15.6M. AOML supports 162 federal and contract employees. AOML is located in Miami, Florida.

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